(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 091 601 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.04.2001 Bulletin 2001/15

(51) Int. Cl.[7]: **H04Q 7/22**

(21) Application number: **00307931.6**

(22) Date of filing: **13.09.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **07.10.1999 US 414178**

(71) Applicant:
NOKIA MOBILE PHONES LTD.
02150 Espoo (FI)

(72) Inventor: **Sivula, Timo**
02660 Espoo (FI)

(74) Representative:
Read, Matthew Charles et al
Venner Shipley & Co.
20 Little Britain
London EC1A 7DH (GB)

(54) Multimedia message content adaptation

(57) In an evolving mobile communications network wherein many different special application services are being deployed for permitting corresponding special content messages to be exchanged between mobile telephones, adaptation of such special content messages between mobile telephones of different capabilities is carried out by a special application service center that receives a special content message from an originating mobile station and, in response thereto, sends a short message using the existing short message service to an addressed terminating mobile station with a notification of the nature of the intended special content message, as well as a short message indicating an alternative method of receiving the special content message if the terminating mobile station is not capable of processing the special content message, for instance, a URL which the user can consult using his personal computer over the internet; if the terminating mobile station is capable of receiving the special content message, it signals the special application service center which, after authentication, then forwards the special content message to the terminating mobile station for processing; if the special application service center does not receive such a request, it posts the special content message at a website that it administers and which can be accessed using a USERID and/or password provided in the short message.

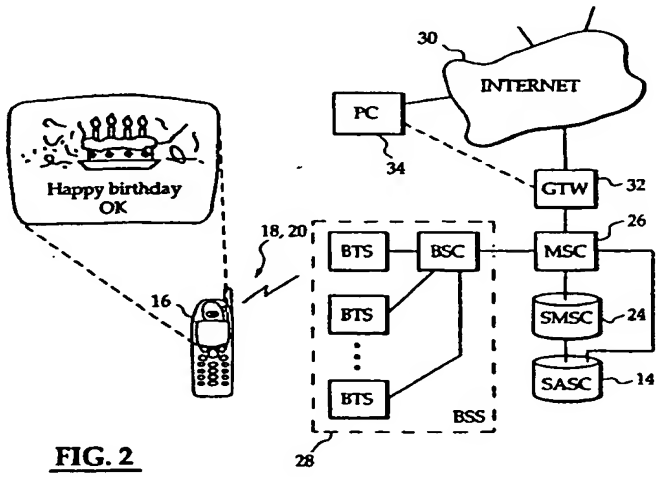

FIG. 2

EP 1 091 601 A2

its display capabilities may be insufficient to display the image sent by the sending phone but may be able to handle SMS. Presently, images can only be sent to phones that are known to have the required image or multimedia capabilities. If an image message is sent to a phone that cannot show the image, the message is lost. The problem is how to adapt the content automatically so that it, or a part of the content, can be presented by most any phone.

[0010] An object of the present invention is to show how a message can be adapted to the capabilities of the receiving terminal so that, even if the terminal cannot display the message fully, the message is not lost, but is adapted to the capabilities of the receiving terminal, and the user is provided with alternative means to view the content.

[0011] According to a first aspect of the invention, a method for use by a mobile station in a mobile communications system in receiving a service from an application service center, comprises the steps of the mobile station receiving a short message, the mobile station determining whether the short message indicates that a special application is required in the mobile station and, if not, processing the short message as a short message and, if so, determining whether the special application is supported in the mobile station and, if not, processing the short message as a short message and, if so, requesting an application service center to provide a service usable according to the special application, the mobile station receiving the service in the form of a special content message from the application service center, and the mobile station processing the special content message according to the special application.

[0012] According to a second aspect of the invention, a method for use by an application service center in providing a special content message provided by an originating mobile station in a mobile communications system to a terminating mobile station in the system, comprises the steps of the center receiving the special content message from the originating mobile station with a request to send the special content message to the terminating mobile station and providing a short message to the terminating mobile station with a part of the short message indicating that a special application is required in the terminating mobile station to fully process the special content message and with a textual part of the short message for use by the terminating mobile station in the event that the special application is not supported by the terminating mobile station, the center receiving a request from the terminating mobile station that the special content message be sent, and the center sending the special content message to the terminating mobile station in response to the request from the terminating mobile station or in the absence of a request from the terminating mobile station, posting the special content message on an internet web page accessible according to the textual part of the short message.

[0013] According to a third aspect of the invention, a method for use in a mobile communications system including an application service center for providing a special content message provided by an originating mobile station of the system to a terminating mobile station of the system comprises the steps of the center receiving the special content message from the originating mobile station with a request to send the special content message to the terminating mobile station and providing a short message to the terminating mobile station with a part of the short message indicating that a special application is required in the terminating mobile station to fully process the special content message and with a textual part of the short message for use by the terminating mobile station in the event that the special application is not supported by the terminating mobile station, the terminating mobile station receiving the short message, the terminating mobile station determining whether the short message indicates that a special application is required in the terminating mobile station and, if not, processing the short message as a short message and, if so, determining whether the special application is supported in the terminating mobile station and, if not, processing the short message as a short message and, if so, sending a request to the application service center to provide the special content message, the center receiving the request from the terminating mobile station that the special content message be sent, the center sending the special content message to the terminating mobile station, the terminating mobile station receiving the special content message from the application service center, and the terminating mobile station providing the special content message to the user according to the special application.

[0014] According to a fourth aspect of the invention, a mobile station for use in a mobile communications system for receiving a service from an application service center, comprises means for receiving a short message, means for determining whether the short message indicates that a special application is required in the mobile station and, if not, processing the short message as a short message and, if so, determining whether the special application is supported in the mobile station and, if not, processing the short message as a short message and, if so, requesting that the application service center provide a special content message for processing in the mobile station according to the special application, means for receiving the special content message from the application service center, and means for providing the special content message to a user of the mobile station according to the special application.

[0015] According to a fifth aspect of the invention, an application service center for use in providing a special content message requested or provided by an originating mobile station in a mobile communications system to a terminating mobile station in the system

Fig. 5 shows functional blocks relevant to the present invention carried out in a terminating mobile station able to receive adapted messages from the special application service center of Figs. 1-3, and

Fig. 6 shows a sequence of steps that may be carried out in the terminating mobile station of Fig. 5, according to the present invention.

[0020] Fig. 1 shows an originating mobile station 10 sending a special content message on a signal line 12 to a special application service center 14, which in this case includes a special application service center in the form of an Image Messaging Service Center (IMSC). The special application service center is able to process the special content message and post it to the internet if necessary, as explained below. The originating mobile station 10 may be a communicator such as a Nokia 9110 with a special application program giving it the ability to form special content messages that include both text and images. Wireless communication systems are expected to gradually evolve, first from mostly voice and limited data generally in use today, to fairly primitive (72 x 28 pixels) black-and-white images using existing short message service centers, second to image messaging with JPEG pictures or equivalent along with concatenated short messages, and finally to multimedia messages with picture, data, text, audio and video. Without limitation, the special application service center 14 of the present invention could therefore be for providing simple graphic message services (GSMC), image message services (IMSC), multimedia services (MMSC), or the like.

[0021] When such a service center 14 receives a special content message, such as the message on line 12 of Fig. 1 from an originating mobile station 10 having the capability to provide the special content message, it is not necessarily the case that a terminating mobile station 16 that is addressed by the originating mobile station 10 is fully capable of processing the special application message. It may, for instance, be a presently available Nokia 3110 or an earlier Nokia 1610 (SMS capable with software V5.02 or later) that is only capable of reading the text part, as provided, for instance, by a short message of a short message service that is embodied in the special application service center or is separate therefrom.

[0022] According to the present invention, the special application service center 14 does not merely provide a store-and-forward function, and therefore it does not simply relay the special application message from the originating mobile station 10 to the addressed terminating mobile station 16. Instead, it first sends a short message signal on a line 18 to the terminating mobile station 16 using the known Short Message Service (SMS) which employs underutilized bandwidth of signaling channels for transmitting short text messages, much like those of a pager. It should be realized that the use of the term "short message" or "short message service" herein encompasses any kind of narrowband method, such as paging, out-of-band transmissions and the like, and not just the known SMS. The short message sent on the line 18 may include a unique password that is generated by the special application service center 14 and that is associated with this specific message. The short message sent on the line 18 to the terminating mobile station may therefore include a textual part such as the following:

> $There is a postcard for you at the following address:
> http://www.abcdefgh.com/directory/filename.html.
> Userid is MSISDNNUMBER and your password is PASSWORD.

Or, the need for passwords can be eliminated by storing each file in a different directory. Using a different directory every time gives the same protection as a password. The file can be named in a way that indicates to the recipient the requirements necessary to process the special content message. If the short message received by the terminating mobile station 16 on the line 18 indicates an application that the terminating mobile station 16 is capable of processing, e.g., by recognizing the directory, the file, or the starting string of the message on the line 18: "$There is a postcard for you at the following address:", the URL, the directory, or file, it starts an interchange between the terminating mobile station 16 and the special application service center 14 in order to cause the service center 14 to send the special content message to the terminating mobile station so that it can be processed according to the corresponding special application and provided to the user via the terminating mobile station 16. This interchange is symbolized by a bidirectional signal line 20.

[0023] Meanwhile, the special application service center 14 has stored the special content message received on the line 12 from the originating mobile station 10 in a memory device resident in the service center 14. If the terminating mobile station 16 does not request the special content message, or if it sends a message back indicating it is not capable, the service center 14 then retrieves the special content message from memory and posts the special content message on a web page having a domain name or URL identified in the short message already sent to the terminating mobile station. In this way, if the terminating mobile station 16 is not capable of processing the special content message, the user can nevertheless read the short message and go to the nearest personal computer or workstation connected to the internet and view the special content message at the URL specified in the short message provided on the line 18, e.g., using the USERID and/or PASSWORD also provided with the short message. In this way, the present invention solves

cuted instead, as shown in Fig. 4. In that step a message can be sent to the originating mobile station 10 on the line 12a that only the short message was sent to the terminating mobile station 16 and that the full special content message was posted on a web page available to users of the internet and maintained by the special application service center 14. Thus, Fig. 3 shows means 62 for posting the special content message (processed according to the special application) on a web page that is maintained in the special application service center and that was identified in the short message sent to the terminating mobile station in the step 40a of Fig. 4. It should be realized that it is not necessary to send any message back to the originating mobile station and that step 60 could simply Consist of posting the special content message to the internet for access by the user of the terminating mobile station 16 by means of a PC 34.

[0031] Fig. 5 shows some of the functions of the terminating mobile station 16 which are pertinent to carrying out the present invention. It will be realized that the terminating mobile station is comprised of various hardware, including an antenna, a transceiver, a modulator, a demodulator, a controller, a display, a speaker, a microphone, a memory, a keypad, etc. The controller in conjunction with the memory are usually assigned the tasks that are shown in functional blocks in Fig. 6 and are normally carried out by software coded, e.g., according to a sequence of steps such as shown in Fig. 6. For instance, the short message provided on the line 18 from the special application service center 14 is received by means 64 for receiving the short message. As mentioned, the processing of this message would typically be carried out by a controller in the form of a microprocessor in conjunction with a program coded according to a step 64a shown in Fig. 6. The means 64 can then provide the short message on a line 66 to means 68 for checking a starting string, as indicated in a step 68a of Fig. 6 and determining, as indicated in a step 68b whether this is a normal SMS message or whether there is a special application indicated. By "normal" SMS message, in this context, is simply meant a message that does not indicate any special content application. If it is a normal SMS message, i.e., there is no special content indicated, the SMS message is processed as a normal short message and displayed on the display of the terminating mobile station 16 in the form of text, as indicated in a step 70. By "normal" SMS message, in this context, is meant a message that includes a short textual message that can be provided to the user interface for display, as is "normal" for SMS messages. This can be carried out by means 70a for processing the SMS message and means 70b for displaying same to the user.

[0032] If it were determined in the step 68b that there is a special content message, a step 72 is carried out by the means 68 or by means 72a for determining the nature of the application. The means 72a will then determine whether the application is supported by the terminating mobile station 16. This is illustrated by a step 72b in Fig. 6. If not, the message is processed as a normal SMS message by the means 70a, 70b as carried out by the step 70 of Fig. 6. If the application is supported, a signal is provided on a line 74 to a means 76 for requesting that the special application service center 14 send the special content message. This is signaled from the means 76 of the terminating mobile station 16 on the line 20a to the special application service center 14.

[0033] As indicated in the step 42a of Fig. 4, when the service center receives the request from the terminating mobile station, it sends the special content message to the requesting terminating mobile station, as indicated by the signal on the line 20b. Before executing the step 54a of Fig. 4, the special application service center of Fig. 3 can check to see if the requesting message came from the same terminating mobile station 16 to which the SMS message on the line 18 was sent, for instance, utilizing caller line identification (CLI). Since the special application service center 14 might have more than one number to which similar SMS messages have been sent, it is useful for the SASC 14 to be able to verify that a message coming from a particular number matches the number to which the original SMS message was sent. An error message can be sent to a terminating mobile station when a mismatch is detected. Or, a special string within the message on the signal line 20a can be searched for.

[0034] The means 64 for receiving the special content message provides the special content message on a line 78 to the means 70a which stores the special content message and may alert the user by sending a signal on a line 80 to the user interface 70b, which may have a mechanism for alerting the user to the arrival of a message.

[0035] As shown by a step 82 in Fig. 6, if the user then requests the service, for instance by pushing a button, the means 70a for processing the special content message according to the corresponding special application program provides the message to the user over the signal line 80 to the user interface 70b, and as indicated by a step 84 of Fig. 6. In this way, the user with a terminating mobile station 16 that is comparable in capabilities to that of the originating mobile station 10 can fully appreciate the message without having to consult a PC 34.

[0036] Although the invention has been shown and described with respect to a best mode embodiment thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omissions and additions in the form and detail thereof may be made therein without departing from the spirit and scope of the invention.

tion;

means for receiving the special content message from the application service center; and

means for providing the special content message to a user of the mobile station according to the special application.

5. Application service center for use in providing a special content message requested or provided by an originating mobile station in a mobile communications system to a terminating mobile station in the system, comprising:

means for receiving the special content message from the originating mobile station with a request to send the special content message to the terminating mobile station;

means for providing a short message to the terminating mobile station with a part of the short message indicating that a special application is required in the terminating mobile station to fully process the special content message and with a textual part of the short message for use by the terminating mobile station in the event that the special application is not supported by the terminating mobile station;

means for posting said special content message to a web page accessible according to said short message in said event;

means for receiving a request from the terminating mobile station that the special content message be sent; and

means for sending the special content message to the terminating mobile station.

6. Mobile communications system, comprising:

an originating mobile station for providing a special content message with a destination address;

a terminating mobile station with the destination address provided by the originating mobile station for receiving the special content message;

an application service center for receiving the special content message from the originating mobile station with a request to send the special content message to the terminating mobile station, the center for providing a short message to the terminating mobile station with a part of the short message indicating that a special application is required in the terminating mobile station to fully process the special content message and with a textual part of the short message for use by the terminating mobile station in the event that the special application is not supported by the terminating mobile station and including means for posting said special content message to a web page accessible according to said short message in said event;

wherein the terminating mobile station includes means for receiving the short message, means for determining whether the start message indicates that a special application is required in the terminating mobile station and, if not, processing the short message as a short message and, if so, determining whether the special application is supported in the terminating mobile station and, if not, processing the short message as a normal short message and, if so, sending a request to the application service center to provide a service usable according to the special application;

the center having means for receiving the request from the terminating mobile station that the special content message be sent, as well as means for sending the special content message to the terminating mobile station;

wherein the terminating mobile station has means for receiving the special content message from the application service center, as well as means for providing the special content message to a user of the terminating mobile station according to the special application.

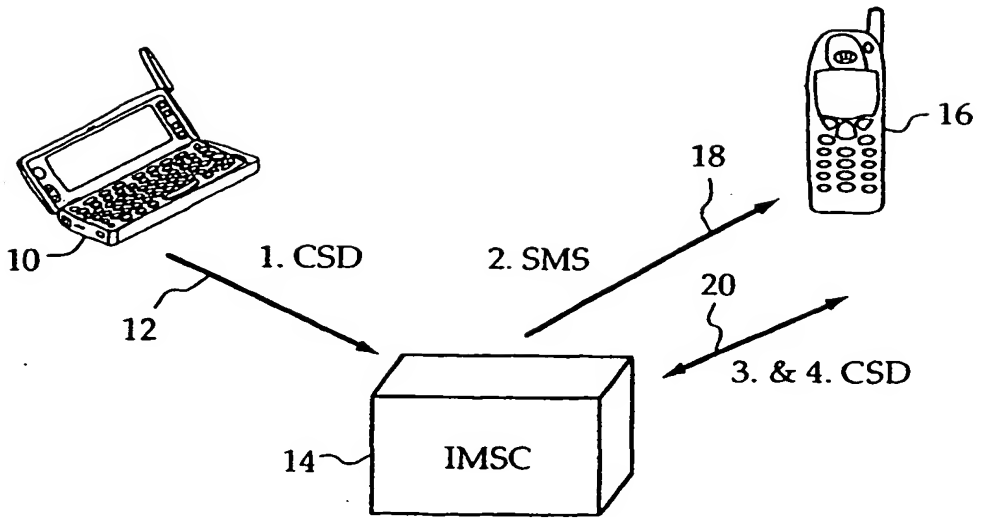
16
18
10
1. CSD
2. SMS
20
12
3. & 4. CSD
14
IMSC

FIG. 1

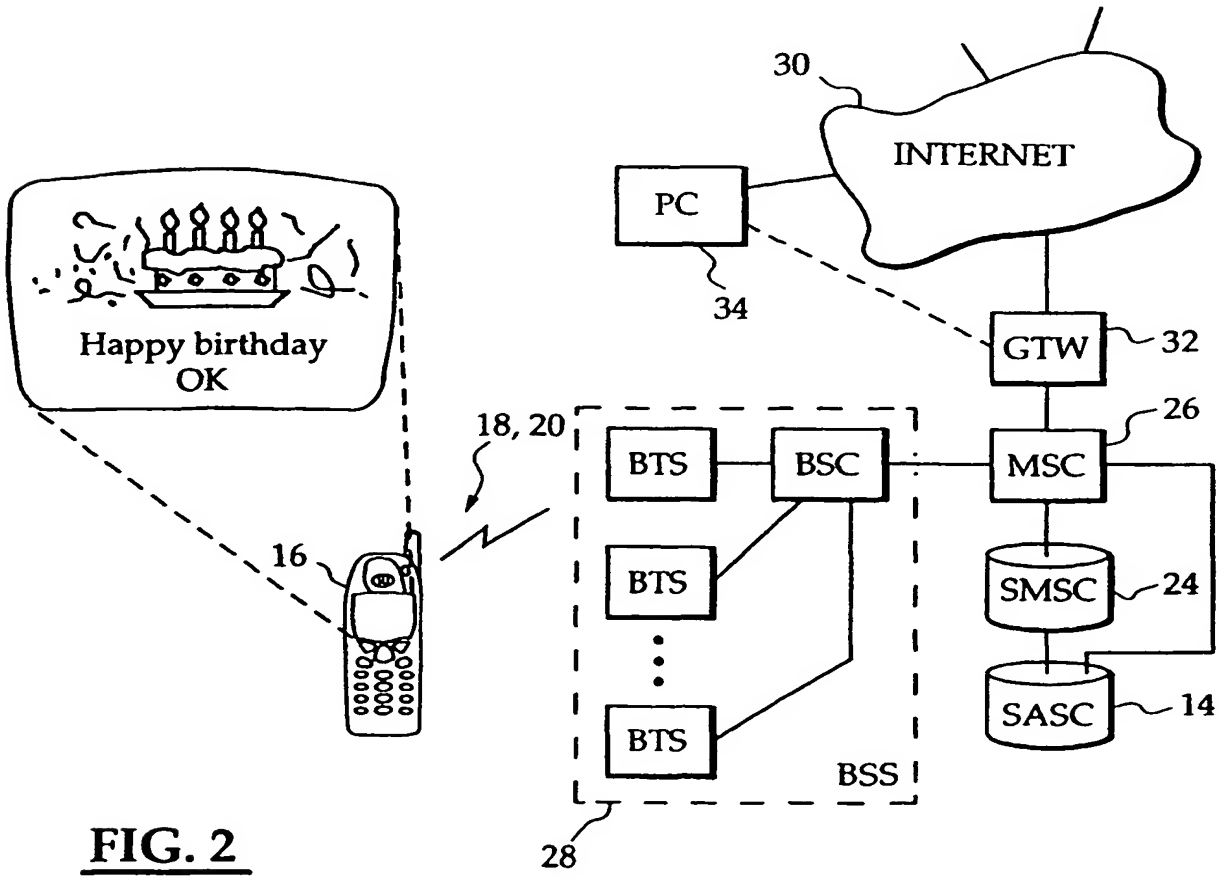
30
INTERNET
PC
34
GTW
32
Happy birthday
OK
18, 20
26
BTS
BSC
MSC
16
BTS
SMSC
24
BTS
SASC
14
BSS
28

FIG. 2

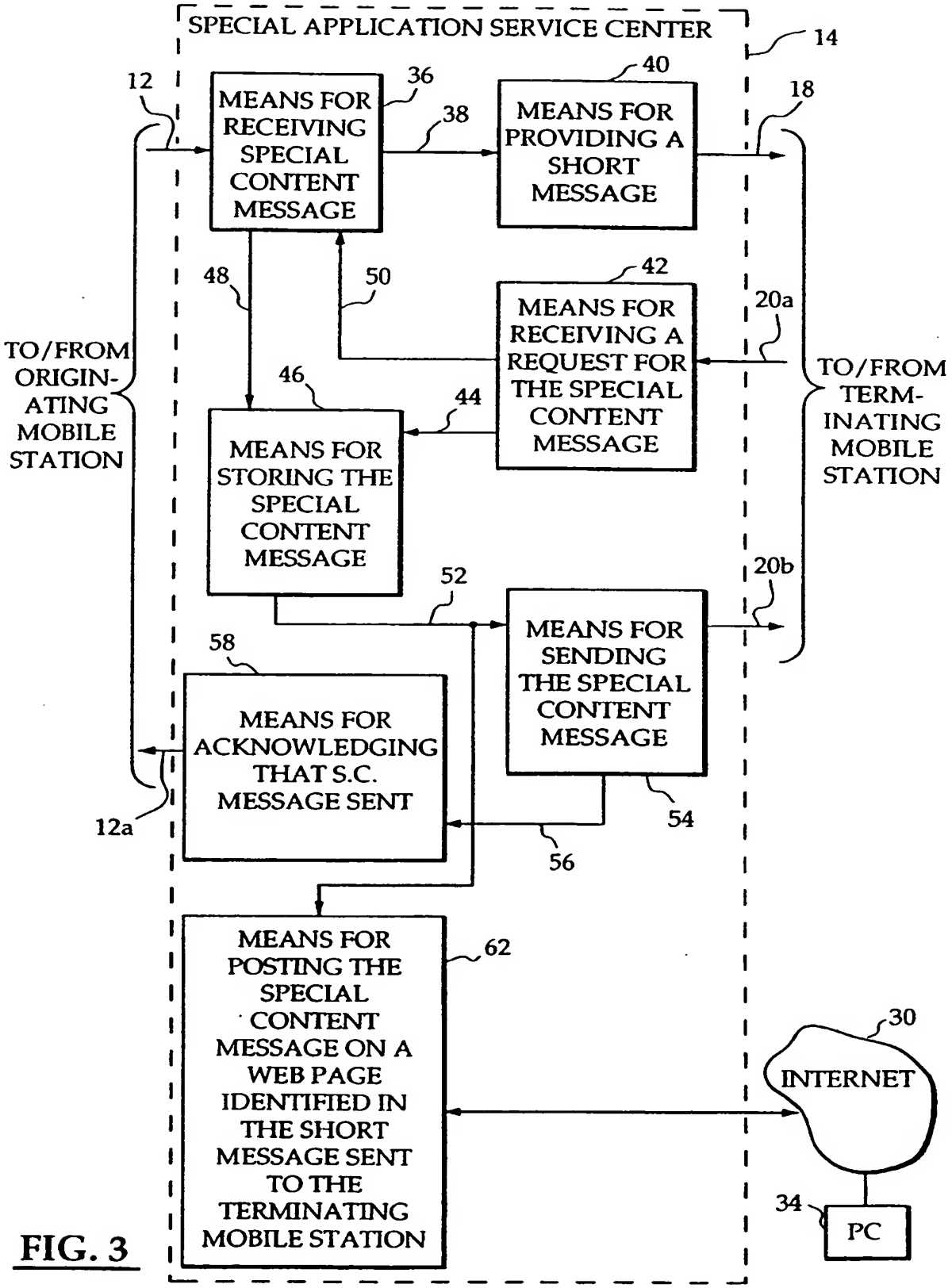
SPECIAL APPLICATION SERVICE CENTER
14
12
36
MEANS FOR RECEIVING SPECIAL CONTENT MESSAGE
38
40
MEANS FOR PROVIDING A SHORT MESSAGE
18
48
50
42
MEANS FOR RECEIVING A REQUEST FOR THE SPECIAL CONTENT MESSAGE
20a
TO/FROM ORIGIN-ATING MOBILE STATION
46
44
MEANS FOR STORING THE SPECIAL CONTENT MESSAGE
TO/FROM TERM-INATING MOBILE STATION
52
20b
MEANS FOR SENDING THE SPECIAL CONTENT MESSAGE
58
MEANS FOR ACKNOWLEDGING THAT S.C. MESSAGE SENT
12a
54
56
MEANS FOR POSTING THE SPECIAL CONTENT MESSAGE ON A WEB PAGE IDENTIFIED IN THE SHORT MESSAGE SENT TO THE TERMINATING MOBILE STATION
62
30
INTERNET
34
PC

FIG. 3

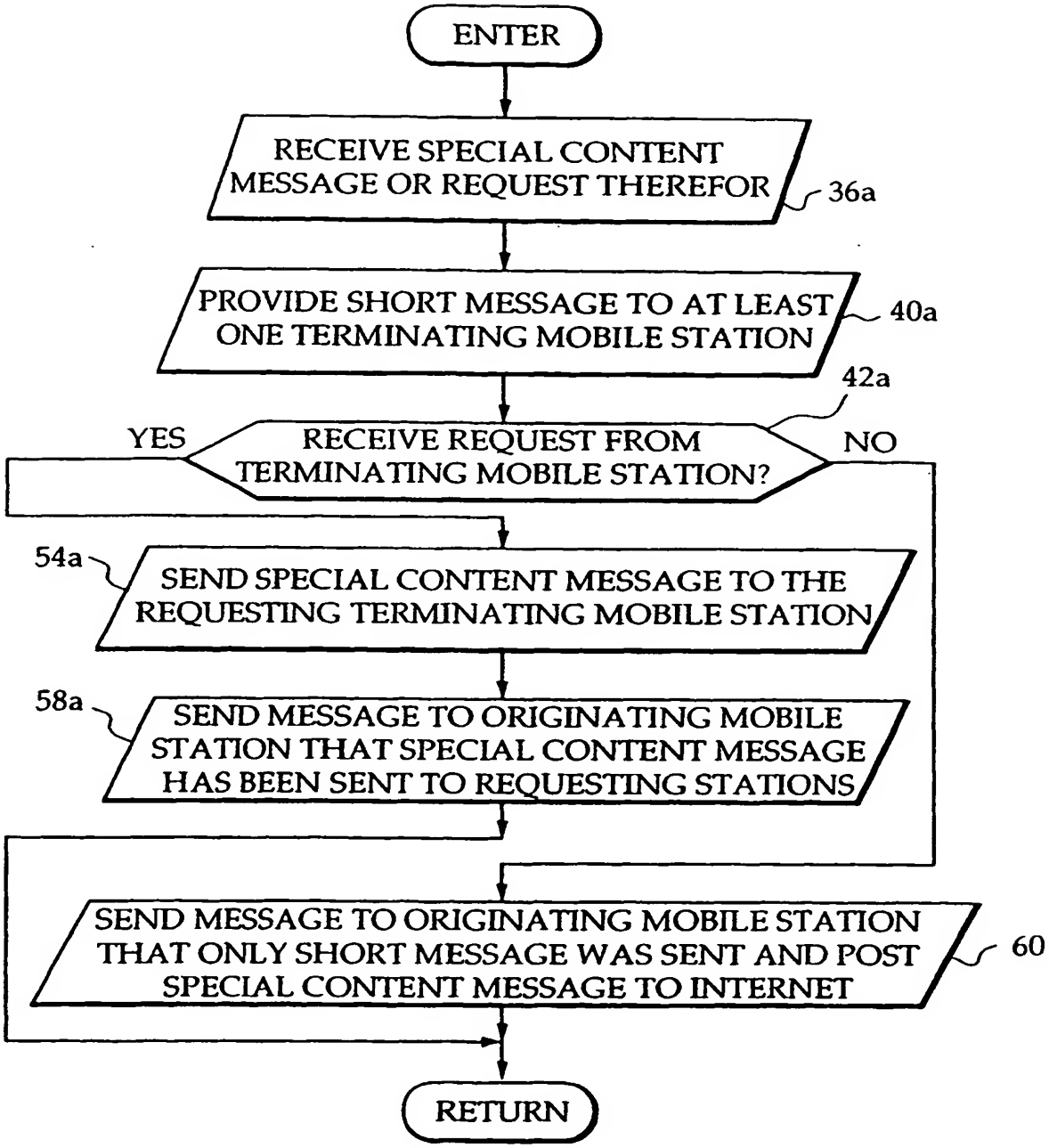
ENTER
RECEIVE SPECIAL CONTENT MESSAGE OR REQUEST THEREFOR
36a
PROVIDE SHORT MESSAGE TO AT LEAST ONE TERMINATING MOBILE STATION
40a
42a
YES
RECEIVE REQUEST FROM TERMINATING MOBILE STATION?
NO
54a
SEND SPECIAL CONTENT MESSAGE TO THE REQUESTING TERMINATING MOBILE STATION
58a
SEND MESSAGE TO ORIGINATING MOBILE STATION THAT SPECIAL CONTENT MESSAGE HAS BEEN SENT TO REQUESTING STATIONS
SEND MESSAGE TO ORIGINATING MOBILE STATION THAT ONLY SHORT MESSAGE WAS SENT AND POST SPECIAL CONTENT MESSAGE TO INTERNET
60
RETURN

FIG.4

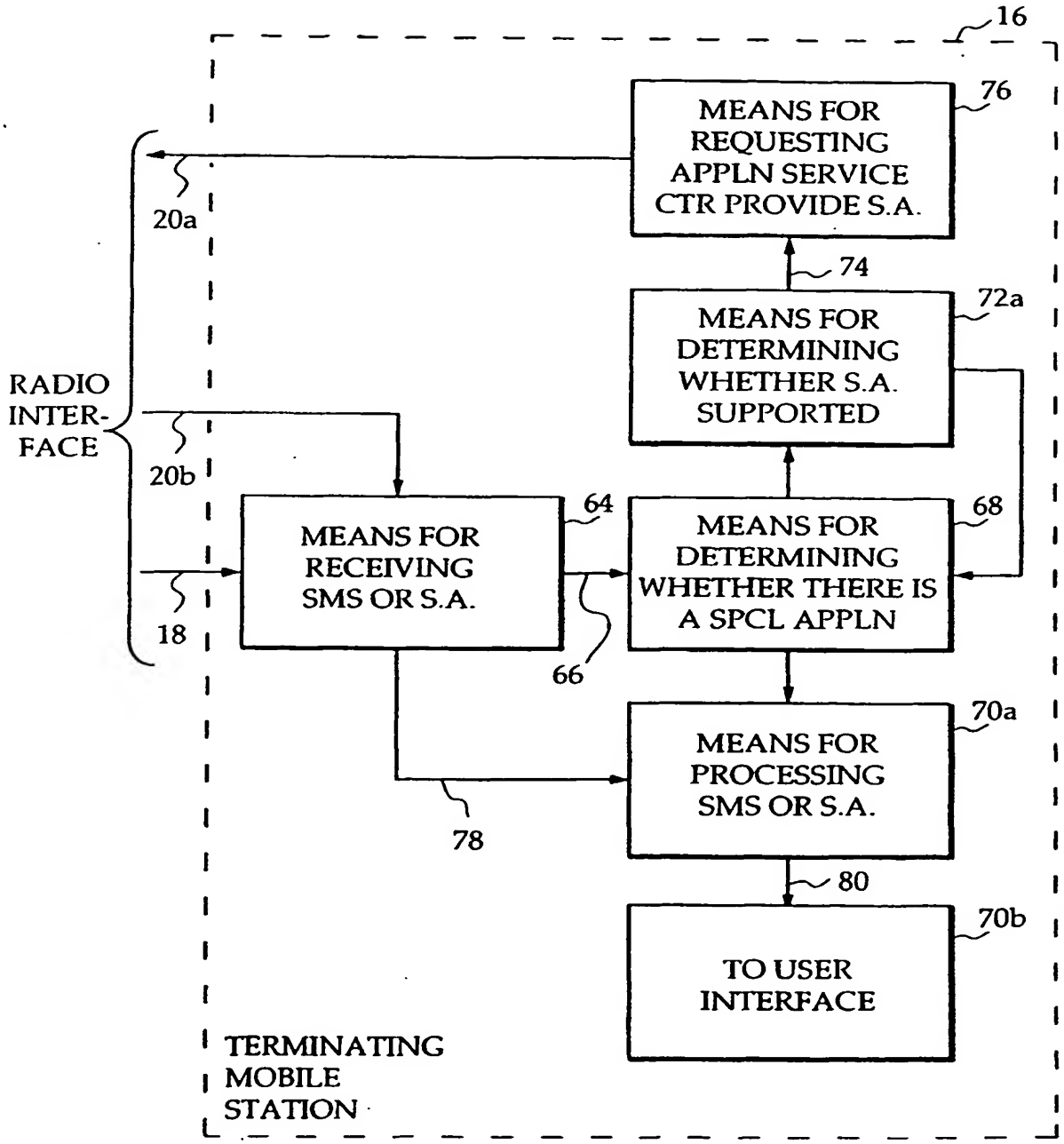
16
MEANS FOR REQUESTING APPLN SERVICE CTR PROVIDE S.A.
76
20a
74
MEANS FOR DETERMINING WHETHER S.A. SUPPORTED
72a
RADIO INTER-FACE
20b
MEANS FOR RECEIVING SMS OR S.A.
64
MEANS FOR DETERMINING WHETHER THERE IS A SPCL APPLN
68
18
66
MEANS FOR PROCESSING SMS OR S.A.
70a
78
80
TO USER INTERFACE
70b
TERMINATING MOBILE STATION

FIG. 5

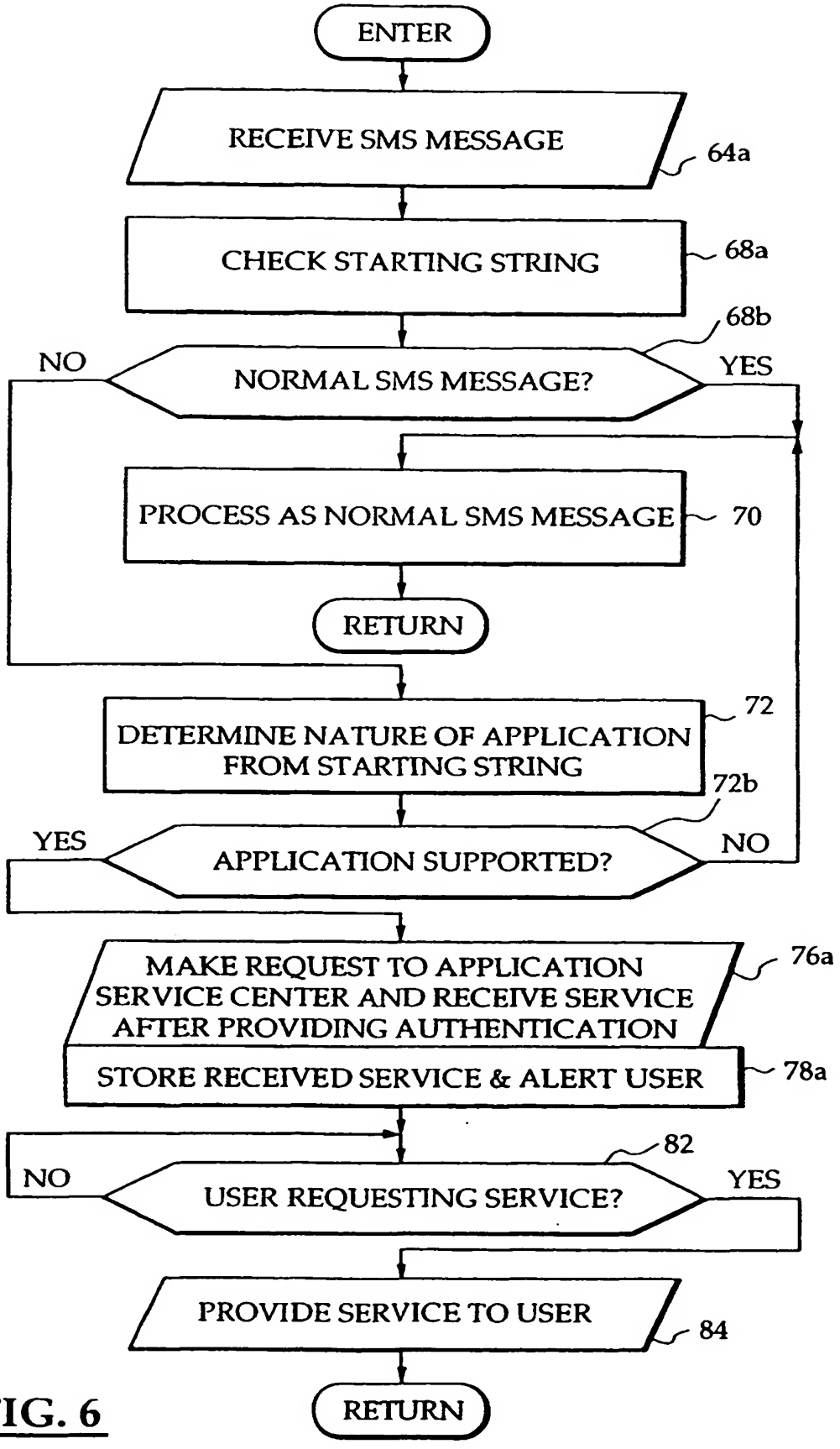
ENTER
RECEIVE SMS MESSAGE
64a
CHECK STARTING STRING
68a
68b
NO
NORMAL SMS MESSAGE?
YES
PROCESS AS NORMAL SMS MESSAGE
70
RETURN
DETERMINE NATURE OF APPLICATION FROM STARTING STRING
72
72b
YES
APPLICATION SUPPORTED?
NO
MAKE REQUEST TO APPLICATION SERVICE CENTER AND RECEIVE SERVICE AFTER PROVIDING AUTHENTICATION
76a
STORE RECEIVED SERVICE & ALERT USER
78a
82
NO
USER REQUESTING SERVICE?
YES
PROVIDE SERVICE TO USER
84
RETURN

FIG. 6